How to date a sedimentary serie: Different approaches to better constrain the diversification of early eukaryotes in Central Africa (Mbuji-Mayi Supergroup, Proterozoic, DRCongo)

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Abstract body.

The Mbuji-Mayi Supergroup, DRC, is located between the Archean-Paleoproterozoic Kasai Craton and the Mesoproterozoic Kibaran Belt. This sedimentary sequence is unaffected by regional metamorphism and preserves a large diversity of well-preserved microfossils, evidencing the evolution of complex life (early eukaryotes) for the first time in Meso-Neoproterozoic record of Central Africa (*Baludikay et al., 2016*). A total of 49 taxa belonging to 27 genera were identified, comprising 11 species of unambiguous eukaryotes, 10 species of possible eukaryotes or prokaryotes and 28 species of probable bacteria.

The lithostratigraphy consists of two distinct successions:

- BII Group: an unconstrained upper carbonate sequence intercalated with shales. Basaltic lavas topping the Mbuji-Mayi Supergroup were dated around 950 Ma (*Cahen, 1974; Cahen et al., 1984*)
- BI Group: a lower siliciclastic sequence (ca. 1174 Ma to ca. 1055 Ma (*Cahen, 1954; Cahen, 1974; Delpomdor et al., 2013; Holmes & Cahen, 1955; Raucq, 1957*) unconformably overlying the ca. 2.82-2.56 Ga granitoid Dibaya Complex (*Cahen, 1972; Delhal et al., 1976; Holmes, A., & Cahen, 1955*).

The diagenesis of BI Group was dated by LA-ICP-MS and Electron MicroProbe (on xenotime, monazite and zircon) between 1030 and 1065 Ma (*François et al., 2016*). Nevertheless, no diagenetic minerals were found in the BII Group which contains the more diverse fossiliferous levels.

Thus, we perform Re-Os dating (Laboratoire de Géochimie des enveloppes externes, IPGP, Paris, France) on fossiliferous shales with the method developed by Birck et al. (1997), to better constrain the age of this BII Group and the age of organic-walled microfossils in the Meso-Neoproterozoic interval.

We also plan to re-evaluate the age of basaltic lavas overlying the Mbuji-Mayi Supergroup (previously dated around 950 Ma (*Cahen, 1974; Cahen et al., 1984*) with Ar-Ar technique (Laboratoire G-Time, ULB, Bruxelles, Belgium & Centre & Dept of Applied Geology, Curtin University, Perth, Australia) to constrain the end of deposition of this Supergroup.

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